FIG. 1
(PRIOR ART)

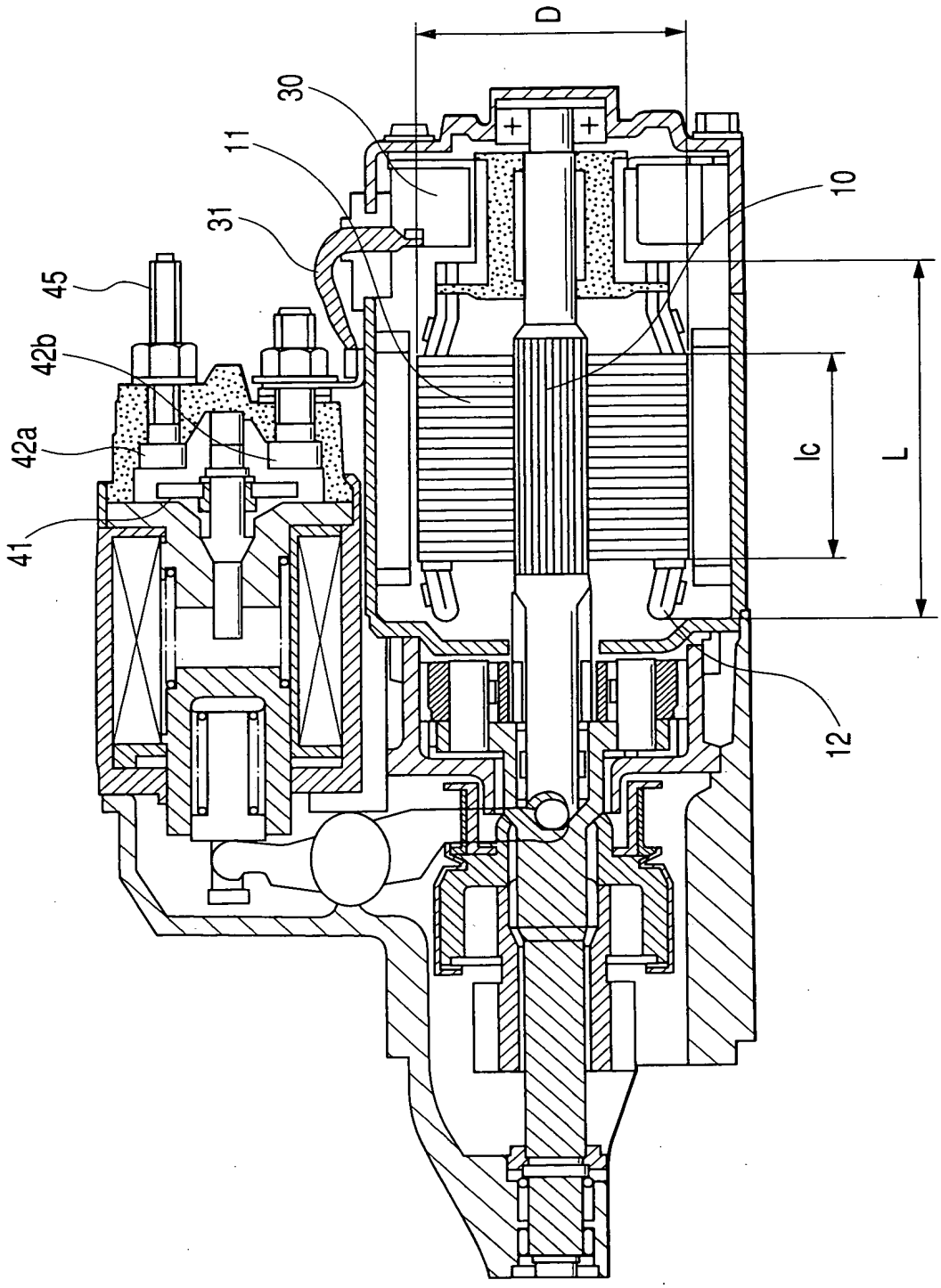


FIG. 2
(PRIOR ART)

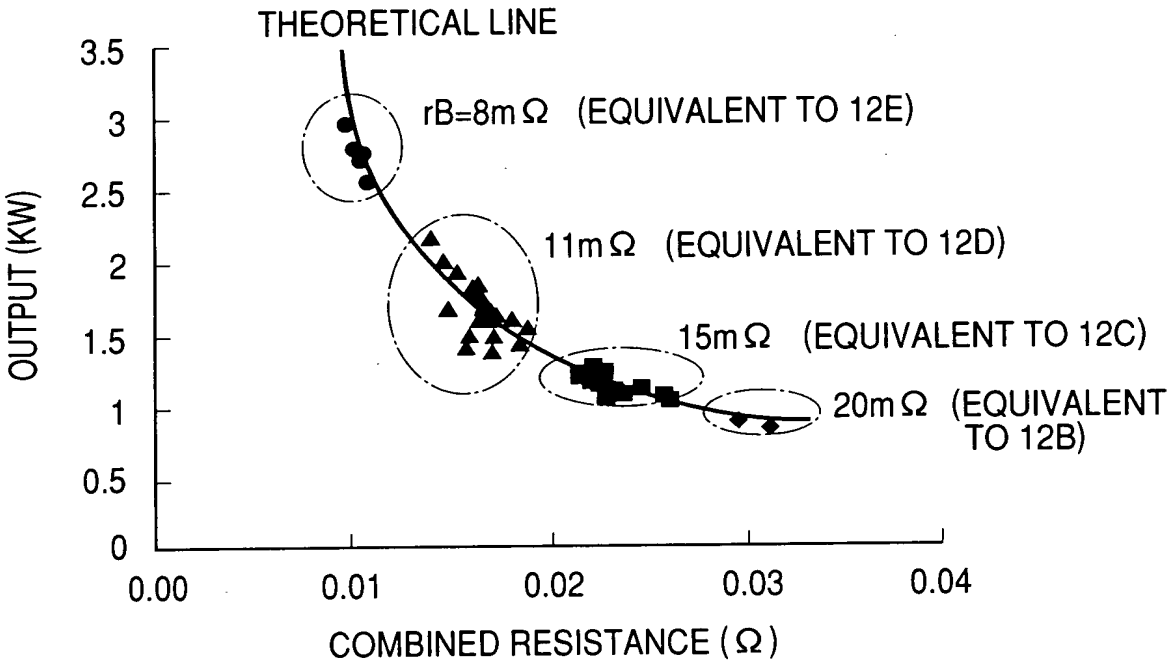


FIG. 3
(PRIOR ART)

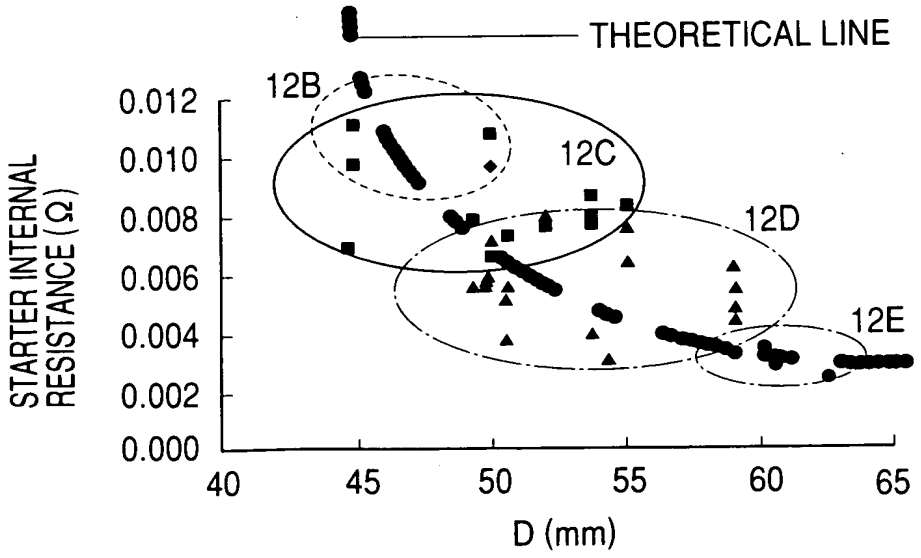


FIG. 4
(PRIOR ART)

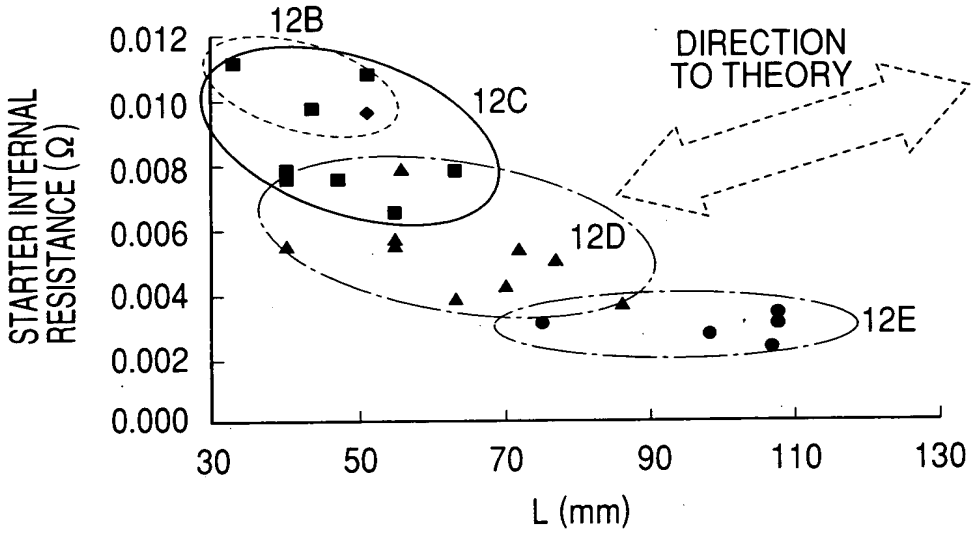


FIG. 5
(PRIOR ART)

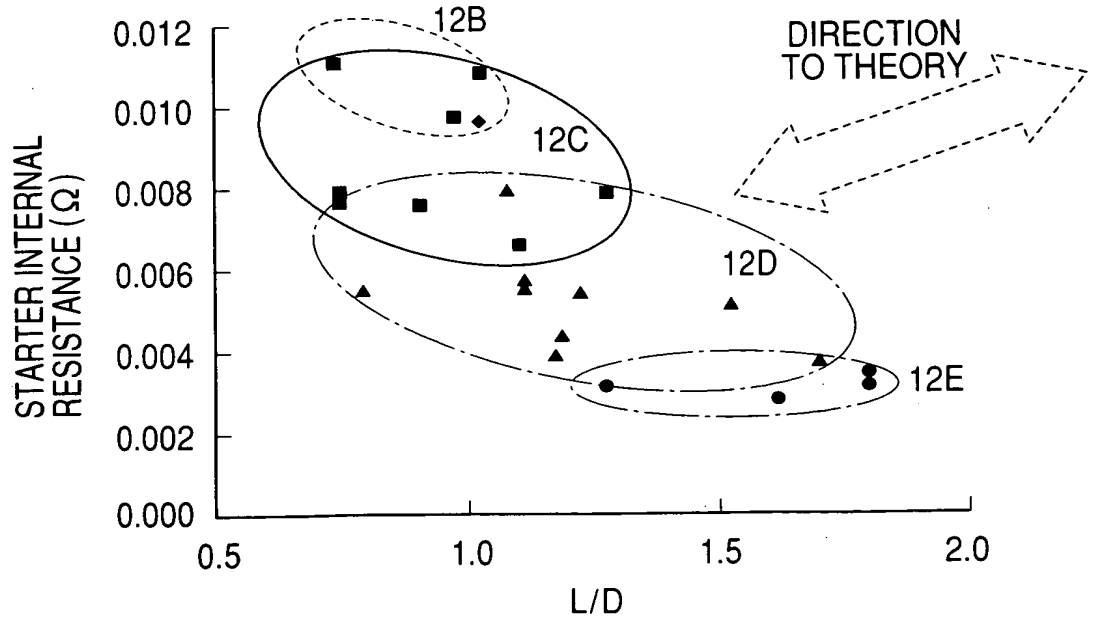


FIG. 6
(PRIOR ART)

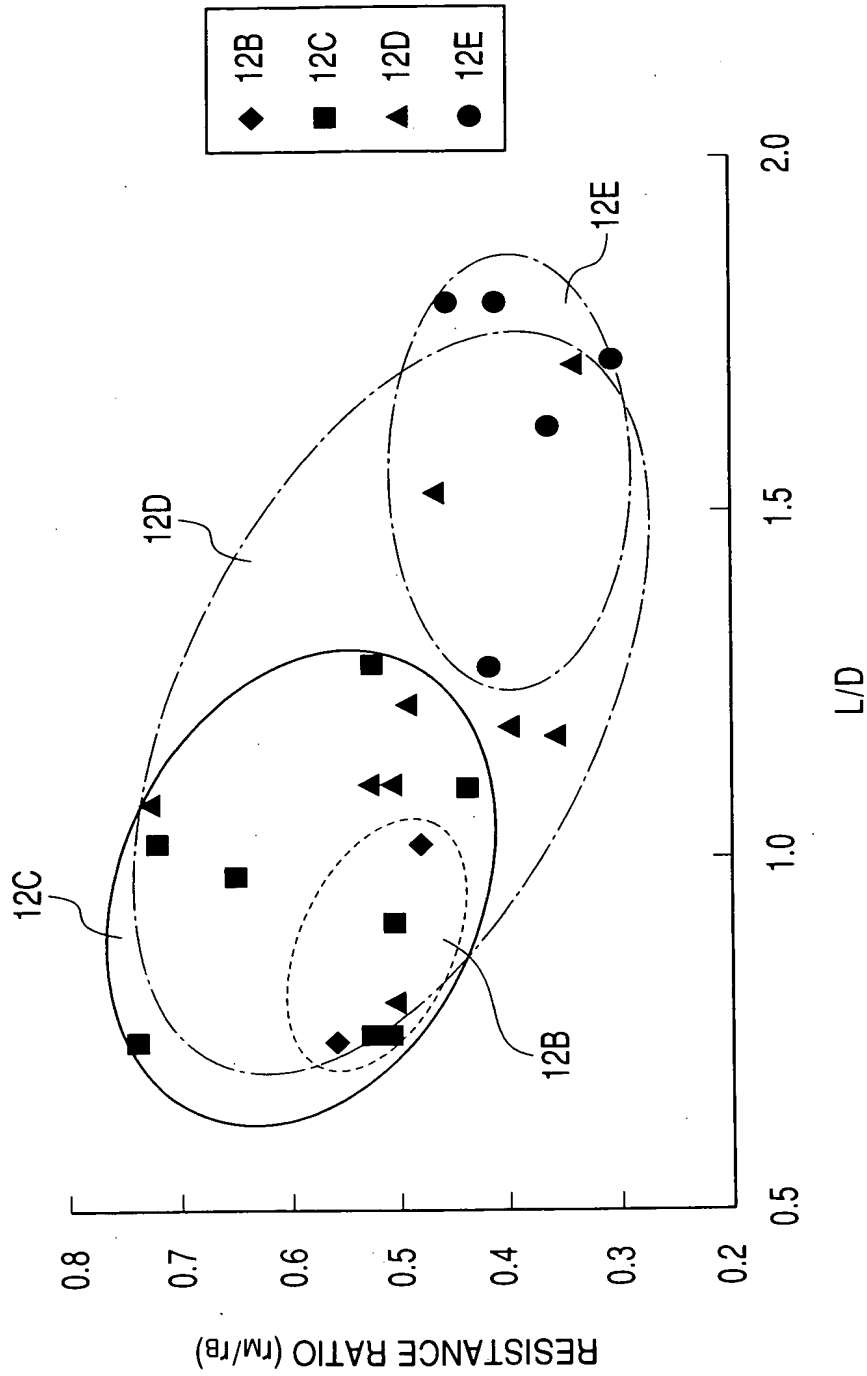


FIG. 7
(PRIOR ART)

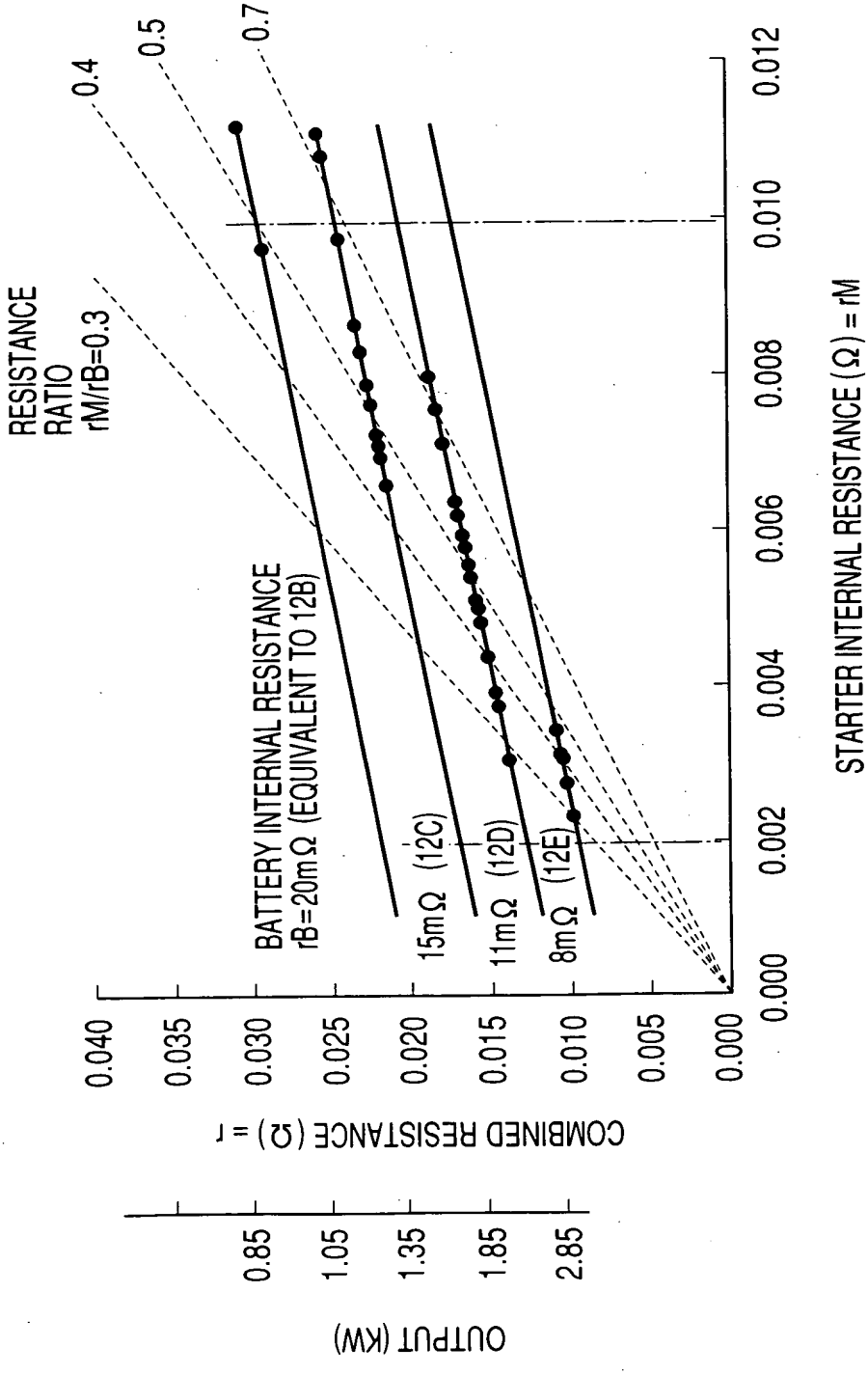


FIG. 8
(PRIOR ART)

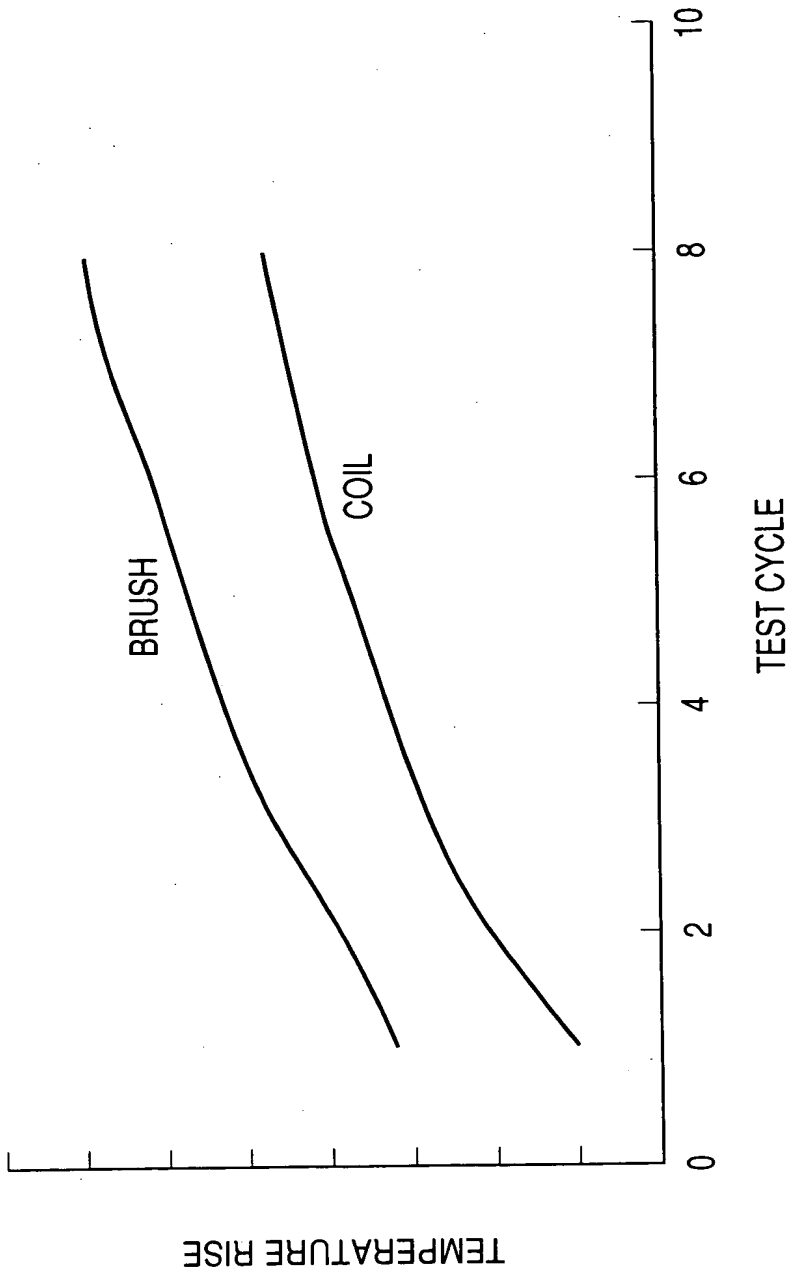


FIG. 9

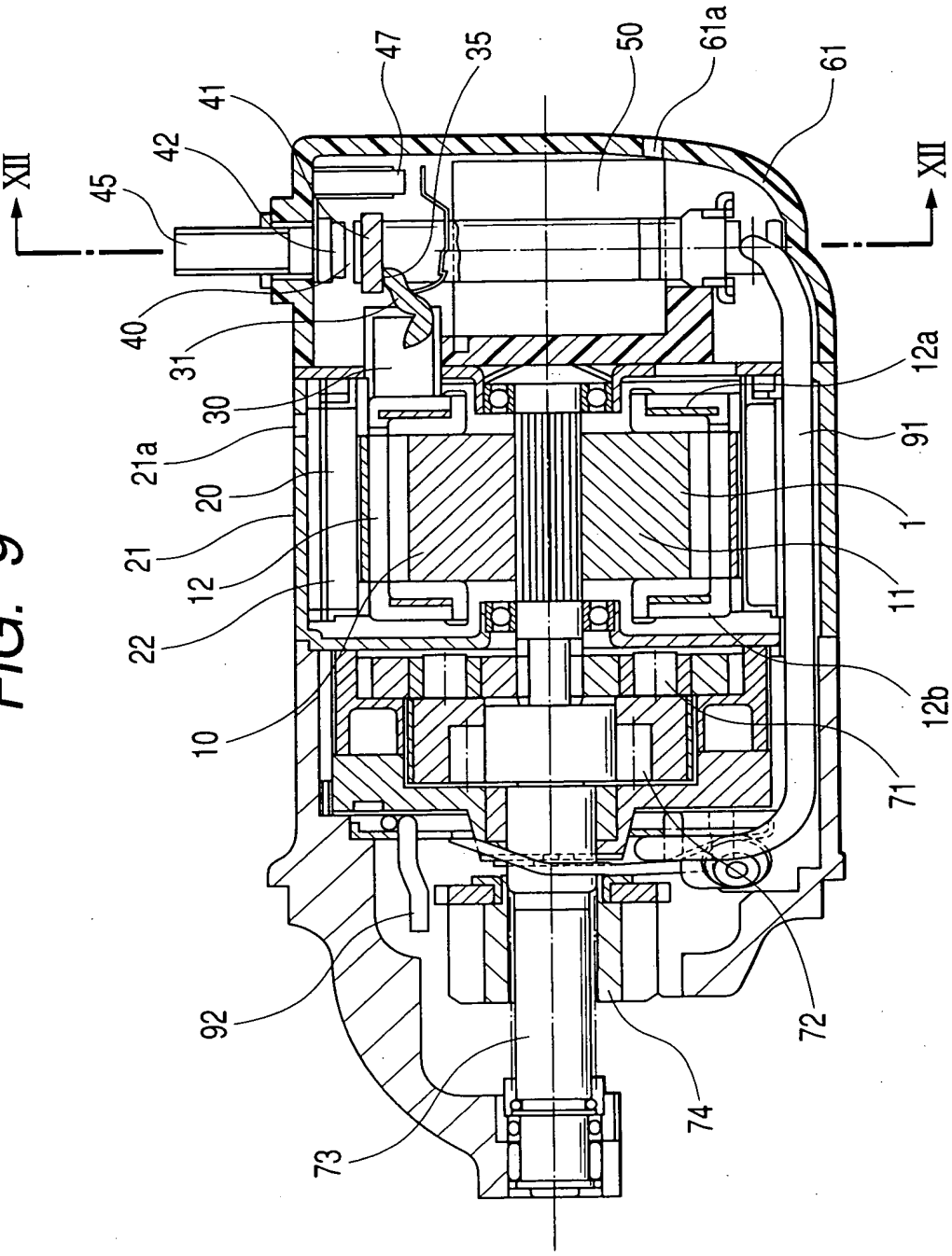

XII
XII
45
41
42
47
35
50
61a
61
40
31
30
21a
20
21
12
22
10
12a
91
1
11
12b
71
72
74
73
92

FIG. 10

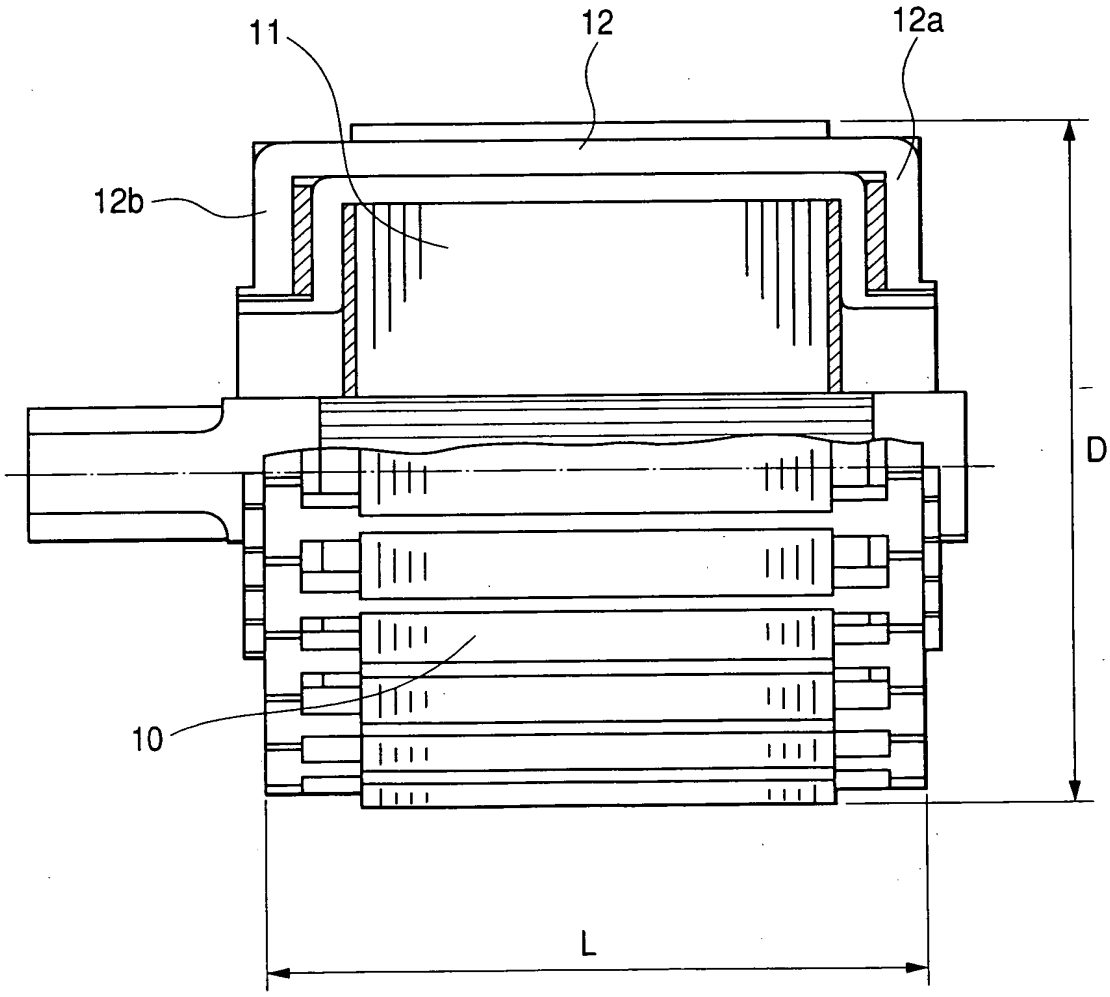


FIG. 11

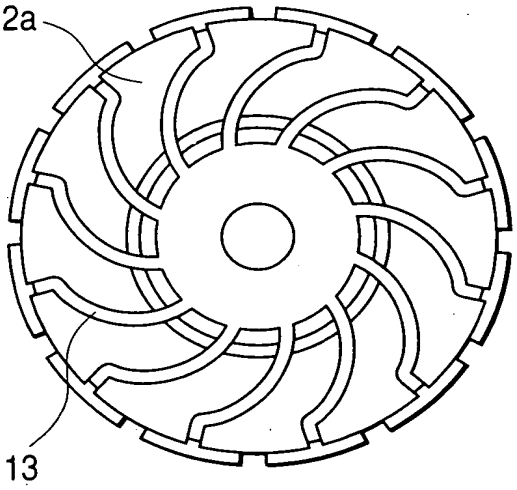


FIG. 12

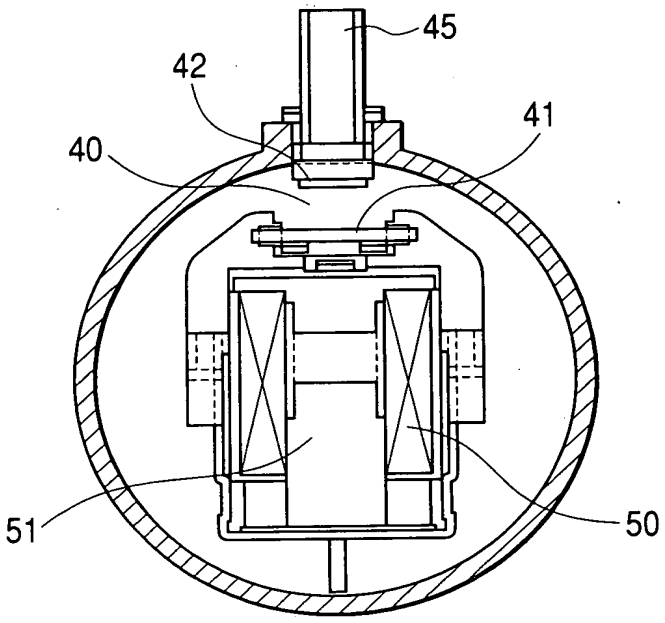


FIG. 13

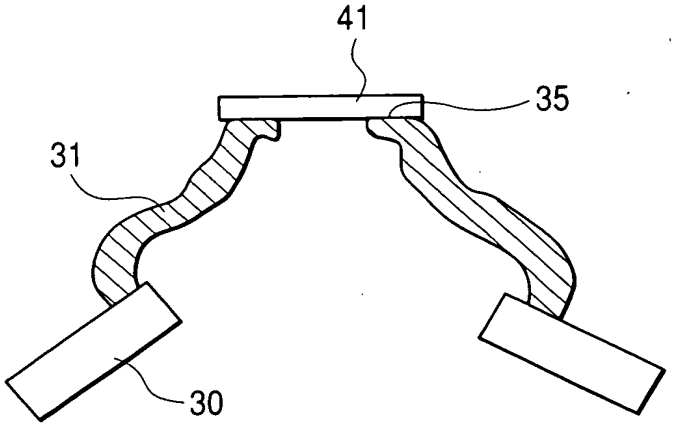


FIG. 14

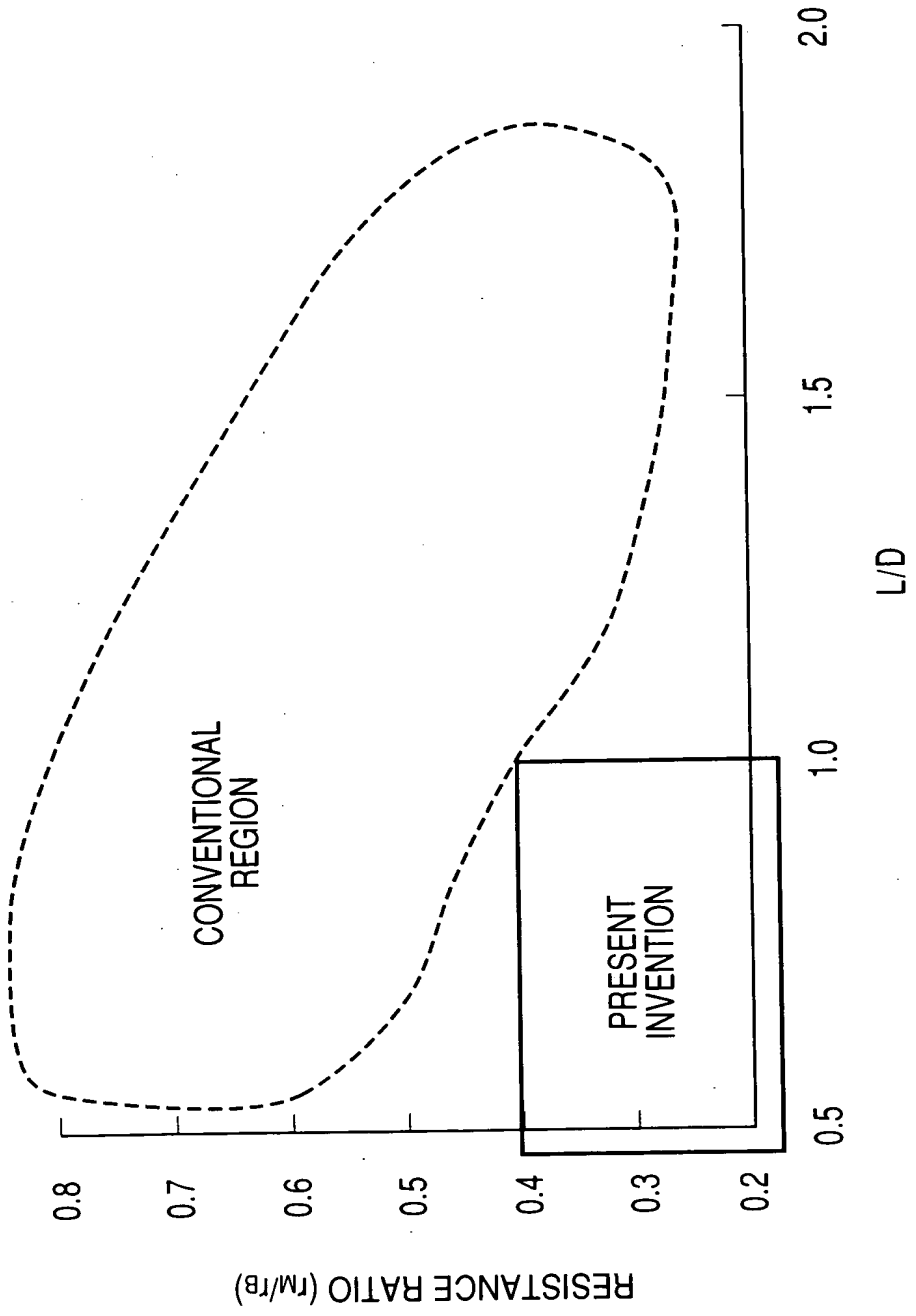

CONVENTIONAL REGION
PRESENT INVENTION
RESISTANCE RATIO (r_M/r_B)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.5
1.0
1.5
2.0
L/D

FIG. 15

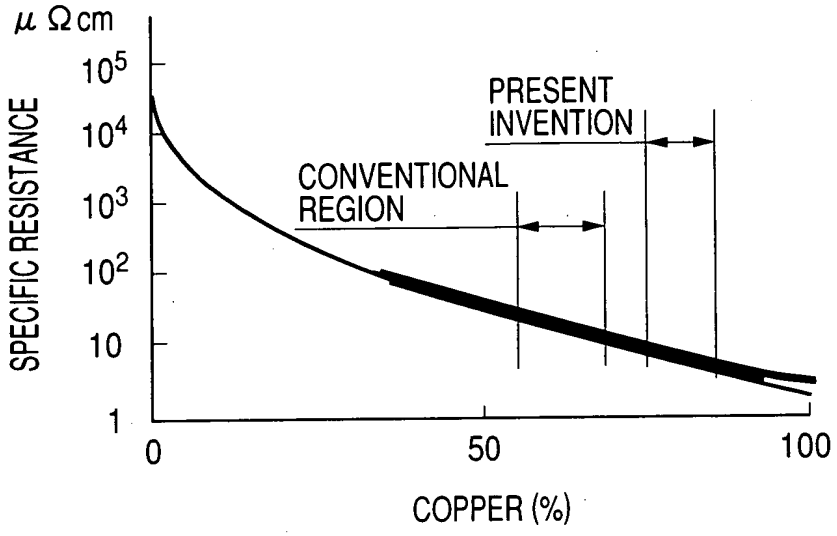

μ Ω cm
SPECIFIC RESISTANCE
10^5
10^4
10^3
10^2
10
1
PRESENT INVENTION
CONVENTIONAL REGION
0
50
100
COPPER (%)

FIG. 16

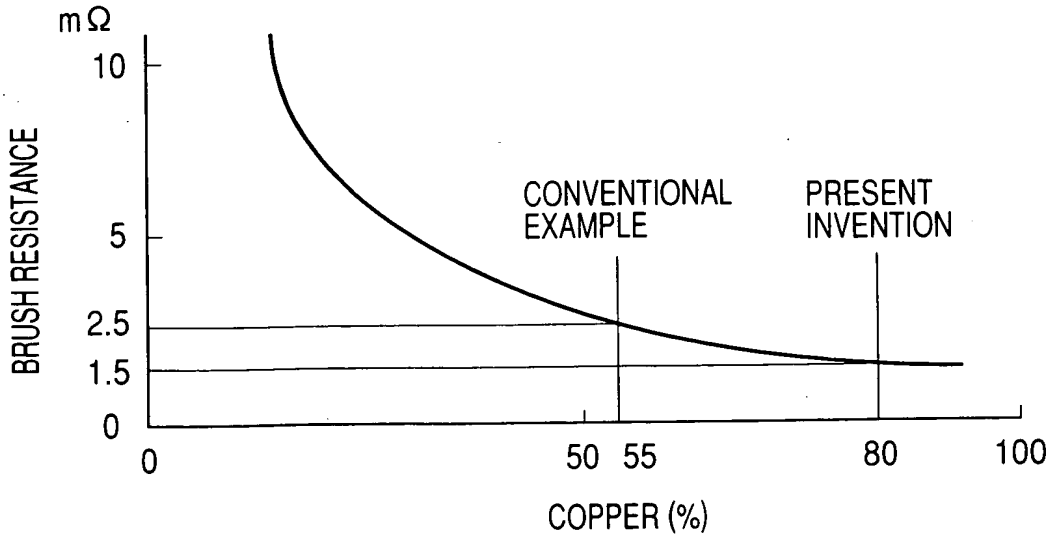
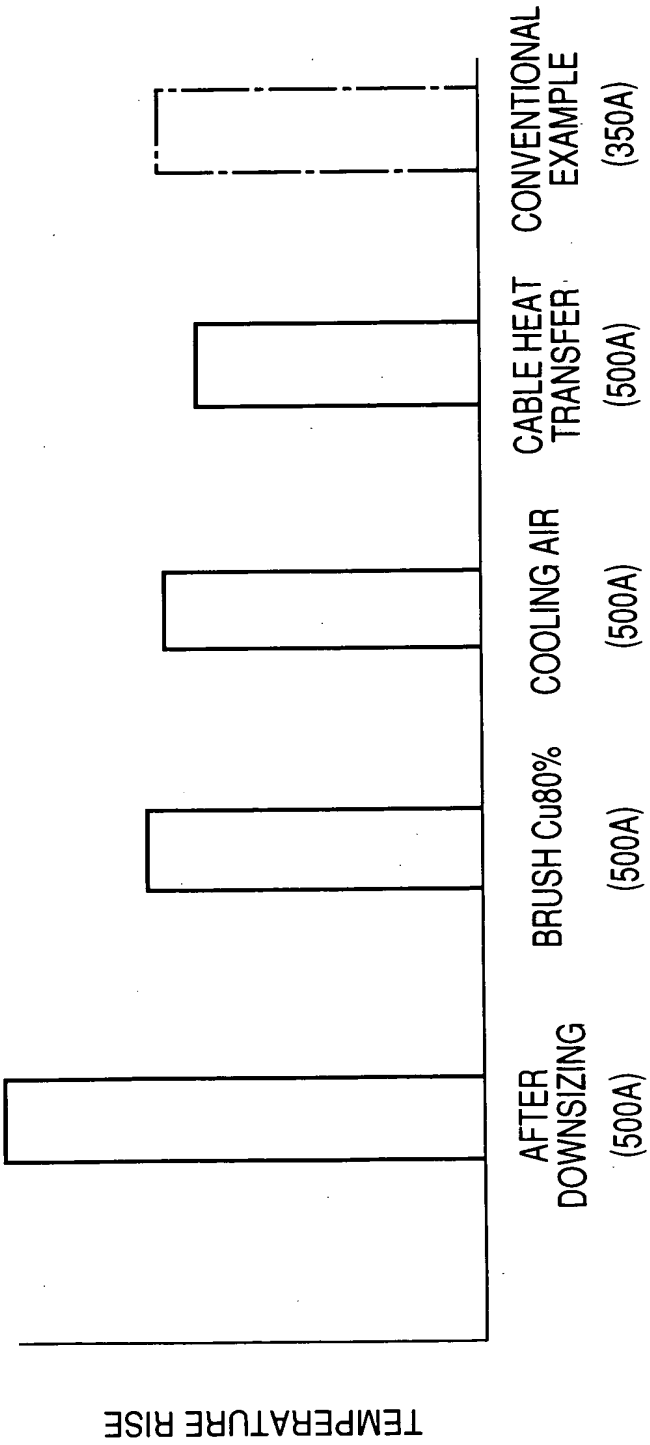

mΩ
BRUSH RESISTANCE
10
5
2.5
1.5
0
CONVENTIONAL EXAMPLE
PRESENT INVENTION
0
50
55
80
100
COPPER (%)

FIG. 17


TEMPERATURE RISE
AFTER DOWNSIZING (500A)
BRUSH Cu80% (500A)
COOLING AIR (500A)
CABLE HEAT TRANSFER (500A)
CONVENTIONAL EXAMPLE (350A)